

Serial No. 09/938,453

Remarks

Claims 1-42 are pending in the application.

Claims 16, 25-28, 30-34, and 40 were indicated to contain allowable subject matter but were objected to as being dependent upon a rejected base claim. They would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 2-41 were objected to because of various informalities.

Claims 1-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent Publication No. US 2002/0126741 A1 of Baum et al. in view of United States Patent No. 6,795,508 issued to Odenwalder et al.

Claims 11-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et al. in view of Odenwalder et al. in further view of United States Patent No. 6,731,700 issued to Yakhnich et al. on May 4, 2004.

Claims 18-24, 29, 35-39, 41, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et al. in view of Yakhnich et al. and Odenwalder et al.

Each of the various rejections and objections are overcome by amendments that are made to the specification, drawing, and/or claims, as well as, or in the alternative, by various arguments that are presented.

Any amendments to any claim for reasons other than as expressly recited herein as being for the purpose of distinguishing such claim from known prior art are not being made with an intent to change in any way the literal scope of such claims or the range of equivalents for such claims. They are being made simply to present language that is better in conformance with the form requirements of Title 35 of the United States Code or is simply clearer and easier to understand than the originally presented language. Any amendments to any claim expressly made in order to distinguish such claim from known prior art are being made only with an intent to change the literal scope of such claim in the most minimal way, i.e., to just avoid the prior art in a way that leaves the claim novel and not obvious in view of the cited prior art, and no equivalent of any subject matter remaining in the claim is intended to be surrendered.

Serial No. 09/938,453

Entry of this Amendment is proper under 37 CFR § 1.116 since the amendment: (a) places the application in condition for allowance for the reasons discussed herein; (b) does not raise any new issue requiring further search and/or consideration since the amendments amplify issues previously discussed throughout prosecution; (c) satisfies a requirement of form asserted in the previous Office Action; (d) does not present any additional claims without canceling a corresponding number of finally rejected claims; or (e) places the application in better form for appeal, should an appeal be necessary. The amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of the amendment is thus respectfully requested.

Claim Objections

Claims 2-41 were objected to because of the following various informalities.

Regarding claims 2-17 and 19-41 the Office Action suggests that in claims 2-17 and 19-21 the recited phrase "The invention as defined in claim..." should be changed, in claims 2-17 to "The method as defined in claim...", and in claims 19-21 to "The receiver as defined in claim...".

This objection is respectfully traversed.

Applicants respectfully point out there is no requirement to point out applicants' invention in the manner suggested by the Office Action. Instead, since 37 C.F.R. 1.75 states that the claim points out the subject matter that applicant regards as his invention, it is necessary that a claim define an invention, and so it is often said, "the claim is the invention". Thus, the language objected to is clear and legally correct, since only dependent claims employ the language and each refers back to another claim that defines an invention. Moreover, many patents have issued with the exact language objected to by the Office Action, indicating that the United States Patent and Trademark Office regards such language as an acceptable form. See for example, the relatively recently issued United States Patents Nos. 5,764,748, 5,784,448, 5,767,751, and 5,767,825.

Claims 14 was objected to, the Office Action requesting that "soft mapping" be changed to "soft bit mapping". In response, applicants have amended claim 11, changing it from reciting "soft bit mapping" to "soft mapping" which is the form used in claims 13

Serial No. 09/938,453

and 14. Applicants note that, as one of ordinary skill in the art will readily recognize, "soft mapping" and "soft bit mapping" clearly refer to the same thing in this application. Since the term "soft mapping" appears more often in the specification, and only one change was necessary to correct all the claims, applicants chose to follow this route.

As to the objection to claim 18, this ground of rejection is respectfully traversed. There is no reason to specify that M is the number of signal detectors or that N is the number of signal sources in claim 18, which is an independent claim. Furthermore, when applicants need to designate a particular designation for the number of signal detectors or signal sources, M and N are appropriately introduced, such as in claims 31 and 33.

Rejection Under 35 U.S.C. 103(a)

Claims 1-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent Publication No. US 2002/0126741 A1 of Baum et al. in view of United States Patent No. 6,795,508 issued to Odenwalder et al. The Office Action states that Baum et al. teaches all of the elements of applicants' claimed invention, except that the transmitted signals are transmitted over multiple antennas. In particular, regarding the joint equalizer element of applicants' claims, the Office Action specifically points out element 330 of Baum et al. and page 5, section 0054, lines 1-3 thereof. However, continues the Office Action, Odenwalder et al. teaches multiple antennas such that one of ordinary skill in the art would readily combine Baum et al. and Odenwalder et al. to arrive at applicants' invention. This is essentially a repetition of the rejection of the previous Office Action.

This ground of rejection is respectfully avoided for the following reasons.

In its response to applicants' prior communication filed April 18, 2005, the Office Action states that applicants' claim language does not reflect the arguments set forth by applicants. Applicants believe that their claim language did adequately represent their arguments, in that the term "joint equalizer" is employed in the claims. Nevertheless, to further prosecution, applicants are setting forth more explicitly elements that were already embodied in the term "joint equalizer", as should be readily apparent from the manner in which applicants used the term and the mathematics described. Thus, it is believed that while the language has changed, the scope of the claim has not.

Serial No. 09/938,453

As noted, applicants have amended the independent claims to better define the joint equalization solution, or the joint equalizer. For example, claim 1 now recites "a joint equalizer solution using channel information for at least one pairing of at least one of said transmit antennas and said receive antennas and said received samples of at least two of said antennas". Similarly, claim 18 was amended to recite "a joint equalizer that develops a joint equalizer solution using channel information for at least one pairing of said at least one of said signal sources and said signal detectors and received samples of at least two of said signal detectors". Likewise, claim 42 recites "means for (i) developing a joint equalizer solution using channel information for at least one pairing of at least one of said transmit antennas and said receive antennas and said received samples of at least two of said receive antennas". This is clearly not taught by Baum et al.

Instead, Baum et al. teaches that each receive antenna employs its own separate equalization unit. Note that in Baum et al. there is a separate element 330 for each branch, with the number of branches corresponding to the number of receive antennas. By contrast, applicants' invention employs only a single, joint equalization element that operates on the signals received from all of the antennas together.

Note that such a joint equalizer is not equivalent to simply putting a box around all of the elements 330 of Baum et al. Such a construct is not a joint equalizer, since the signals from each receive antenna is processed separately therein. Furthermore, applicants' joint equalizer produces a number of output streams based on the number of transmit antennas. By contrast, in Baum et al., there is one equalized output stream for each receive antenna.

Thus, Baum et al. does not teach or suggest determining a joint equalizer solution using channel information for at least one pairing of at least one of the transmit antennas and the receive antennas, as required by applicants claims 1-10 and 15.

The Office Action recognizes that Odenwalder et al. does not teach a joint equalizer. Consequently, Odenwalder et al. cannot cure the deficiency of Baum et al., and hence the combination of Baum et al. and Odenwalder et al. does not render applicants' claims obvious.

Serial No. 09/938,453

Claims 11-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et al. in view of Odenwalder et al. as applied to claim 1 as described hereinabove in further view of United States Patent No. 6,731,700 issued to Yakhnich et al. on May 4, 2004.

This ground of rejection is respectfully traversed, since it pertains only to dependent claims of claim 1 and relies on the rejection of claim 1 based on Baum et al. in view of Odenwalder et al. that was traversed hereinabove, and the Office Action makes no showing that Yakhnich et al. it teaches or suggests the element of a joint equalizer solution as now recited that was shown herein to be missing from that combination.

Claims 18-24, 29, 35-39, 41, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et al. in view of Yakhnich et al. and Odenwalder et al.

This ground of rejection is respectfully traversed for the following reasons.

Each of independent claims 18 and 42 contains a limitation similar to that of claim 1 which requires determining a joint equalizer solution using channel information for at least one pairing of at least one of the transmit antennas and the receive antennas and said received samples of at least two of said antennas. As noted hereinabove, none of the cited references teaches or suggests such an element. Therefore, independent claims 18 and 42 are allowable over the proposed combination.

Since all of the dependent claims that depend from independent claims 1, 18 and 42 include all the limitations of the respective independent claim from which they ultimately depend, each such dependent claim is also allowable over Baum et al., Yakhnich et al. and Odenwalder et al., or any combination thereof, under 35 U.S.C. 103.

Serial No. 09/938,453

Conclusion

It is respectfully submitted that the Office Action's rejections have been overcome and that this application is now in condition for allowance. Reconsideration and allowance are, therefore, respectfully solicited.

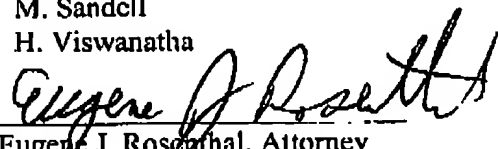
If, however, the Examiner still believes that there are unresolved issues, he is invited to call applicant's attorney so that arrangements may be made to discuss and resolve any such issues.

In the event that an extension of time is required for this amendment to be considered timely, and a petition therefor does not otherwise accompany this amendment, any necessary extension of time is hereby petitioned for, and the Commissioner is authorized to charge the appropriate cost of such petition to the **Lucent Technologies Deposit Account No. 12-2325**.

Respectfully,

H. C. Huang
L. E. Mailaender
M. Sandell
H. Viswanatha

By


Eugene J. Rosenthal, Attorney
Reg. No. 36,658
732-949-1857

Lucent Technologies Inc.

Date: _____